gene (which is the sum of the frequencies of the chromosomes carrying C) is obtained by gene adding methods:

$$\bar{C} = \overline{CC} + \tfrac{1}{2}\overline{Cc}$$

$\bar{E}$ is obtained similarly.

If, as in all these samples, recognizable genotypes containing CDE and CdE are absent, then:

$$\overline{cde} + \overline{cD^{e}e} + \overline{cDe} = 1 - (\bar{C} + \bar{E})$$

Provisional separate values for these three chromosome frequencies are obtained by square root formulae involving the frequencies of the phenotypes ccddee, $ccD^{e}ee$ and ccDee, and the resultant values are adjusted proportionally so that their sum is that already obtained. The frequencies of the rarer chromosomes are then obtained from these basic values by further equations based on the simple genetical rules, e.g.

$$Cde = \frac{\overline{Ccddee}}{2\ \overline{cde}}$$

In certain cases, such as that of the Luo, it has been necessary to devise further equations, based on the same principles, to meet special eventualities.

The good agreement between the observed phenotype frequencies and the expected frequencies calculated from those of the genes are evidence of the general accuracy of the serological tests and the homogeneity of the populations tested. The deficiency of AB among the Masai, as compared with the expected number, is probably due to a small number of A_2B bloods having been taken for B, an error difficult to avoid under field conditions. Since both on internal and on external evidence the mixed series of Luo and Kikuyu specimens was probably not highly heterogeneous from a blood group standpoint, and since gene frequencies are of great help in comparing one population with another, this series has been treated as though homogeneous, and gene frequencies calculated as for the others

TABLE I. *The ABO Blood Groups of the Luo*

Group	Number observed	Frequency observed	Frequency expected	Number expected
O	58	0·4531	0·4735	60·59
A_1	24	0·1875	0·1760	22·52
A_2	8	0·0625	0·0512	6·55
B	35	0·2734	0·2507	32·09
A_1B	3	0·0234	0·0367	4·70
A_2B	0	0·0000	0·0118	1·51
	128	0·9999	0·9999	127·96

[p.56a]

18: Allison et al. D-5 (1949) 1952
FL11 Luo FL11
Kikuyu FL10

I.—Blood Groups in some Kenya Tribes

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This communication embodies the results of A,A,BO, MNS, and Rh tests on the Luo and Kikuyu tribes of Kenya, together with P tests on the Kikuyu and ABO tests on the Masai. The specimens were collected as part of the anthropological investigation carried out while one author (A.C.A.) was a member of the Oxford University Mount Kenya Expedition, 1949.

The only previous anthropological blood group study carried out in this area is the work of Eladon-Dew (1939) on the ABO groups of some East African native populations.

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The Luo and Kikuyu are two of the largest tribes in the country and although neither is "racially pure" they differ in language and custom and are generally believed to differ in origin. The Luo may be taken as representative of the Nilotic group and the Kikuyu of the Eastern Bantu.

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The subjects were hospital patients and groups of labourers, the Luo from Nairobi and Nakuru districts, the Kikuyu from Nairobi, Kiamba and Embu districts. Individuals who were tested were unrelated to one another and were not aware of having any forebears from other tribes. Specimens were taken in the form of clotted blood by means of "Venules" and sent by air to London. Specimens were taken without mishap or complication from 128 Luo and 124 Kikuyu. Specimens were also taken from a further 61 Luo and 111 Kikuyu, but owing to an unsatisfactory system of labelling became mixed in transit. As will be shown below, the Luo and the Kikuyu differ little in their blood group frequencies and the mixed specimens differ little from either of the pure batches. Moreover, the total number of

[p. 55 b]

MNS and Rh tests recorded for Africans is very small. It has therefore been thought desirable to place on record the results of our tests on these mixed specimens as representing a general and not highly heterogeneous sample of the East African native population.

The specimens arrived in London in good condition in about three days. Tests for the ABO system were done with anti-A, anti-A_1 and anti-B. Rh tests were done with anti-C, anti-D, anti-E and anti-c. All E positive bloods were tested with anti-e, and all bloods negative with saline anti-D were tested for the D^u antigen by means of an indirect Coombs test with "incomplete" or albumin-agglutinating anti-D. Dr. K. Henningsen, of Copenhagen, was visiting the Laboratory and tested 66 Kikuyu bloods for P by the elaborate and highly accurate method which he has devised for detecting this difficult antigen, with results which he has recently published (Henningsen, 1950). In addition, ABO grouping was carried out in the field near Magadi on 233 Masai tribesmen.

The methods used in the gene frequency calculations are based on the accepted theories of the genetics of the respective blood group systems, which are conveniently set out in the chapters on the various systems by Race and Sanger (1950). The details of the methods are too complicated to set out within the limits of a paper such as this, but will shortly be published in full by Mourant (1953).

For the ABO system the methods are based on the corrected method of Bernstein (1930). For the MNS system the total frequencies of the M and N genes are calculated by the gene adding method (e.g. $\overline{M} = \overline{MM} + \frac{1}{2}\overline{MN}$) and the total S frequency thus:

$$\overline{S} = 1 - \sqrt{\overline{MsMs} + \overline{MsNs} + \overline{NsNs}}$$

This value for $\overline{S}$ is then divided up between $\overline{MS}$ and $\overline{NS}$ in proportion to values for $\overline{MS}$ and $\overline{NS}$ derived separately from the values of $\overline{MMS}$ and $\overline{MsMs}$; and of $\overline{NNS}$ and $\overline{NsNs}$.

For the Rh system the total frequency of the C

[p. 55C]